

Notice of Allowability

Application No.

09/964,586

Examiner

Nitin Parekh

Applicant(s)

FRUTSCHY ET AL.

Art Unit

2811

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to 8-31-06.
2. ☒ The allowed claim(s) is/are 2,3,7-9,65-67,69,70,73-75 and 79.
3. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) ☐ All b) ☐ Some* c) ☐ None of the:
 1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.

THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
 5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
 - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
 - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
 - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☐ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3. ☐ Information Disclosure Statements (PTO/SB/08),
Paper No./Mail Date _____
4. ☐ Examiner's Comment Regarding Requirement for Deposit
of Biological Material
5. ☐ Notice of Informal Patent Application
6. ☐ Interview Summary (PTO-413),
Paper No./Mail Date _____
7. ☒ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other _____

Nitin Parekh

Nitin Parekh
Primary Examiner
Technology Center 2800

DETAILED ACTION

Allowable Subject Matter

1. Claims 2, 3, 7-9, 65-67, 69, 70, 73-75 and 79 are allowed.
Claims 1, 4-6, 10-64, 68, 71, 72, 76-78 and 80-92 have been canceled.

Examiner's Amendment

2. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it **MUST** be submitted no later than the payment of the issue fee.

Enter the amendment as follows:

1. (Cancelled)
2. (Currently Amended) An integrated circuit (IC) package comprising: a substrate supporting at least a die; and a package stiffener mounted at a perimeter of the substrate directly and not upon an interposer, and arranged apart from the die on the substrate to deliver low-inductance current to the die, via the substrate directly and not via the interposer, while concurrently providing stiffening support to the substrate~~An IC package as claimed in claim 78,~~
wherein the package stiffener includes a copper ring split into power and ground portions, and insulating couplers electrically isolating the power and ground portions of the split copper ring.

3. (Previously Presented) An IC package as claimed in claim 2, wherein the split copper ring mounts on the substrate via a solder with a low resistance path to deliver large amounts of current to the substrate and remove heat from the substrate.

4-6. (Cancelled)

7. (Currently Amended) An IC package as claimed in claim 2 [[78]], wherein the package stiffener includes one of electrically conductive, insulating, and intermingled electrically conductive and insulating sections, and one of a molded, stamped, etched, extruded and deposited frame, wherein the stiffener is to withstand temperatures of at least normal IC operation.

8. (Previously Presented) An IC package as claimed in claim 2, further comprising a heat spreader plate bonded to the split copper ring by epoxy and to the die by thermal interface material.

9. (Currently Amended) An IC package as claimed in claim 2 [[78]], wherein the package stiffener is to support at least partially a heat sink.

10-64. (Canceled)

65. (Currently Amended) An integrated circuit (IC) package as claimed in claim 2 [[84]] wherein the package stiffener [[frame]] extends along at least two side edges of the substrate.

66. (Currently Amended) An integrated circuit (IC) package as claimed in claim 2 [[84]] wherein the package stiffener [[frame]] is positioned at two separate sections on the substrate.

67. (Currently Amended) An integrated circuit (IC) package as claimed in claim 2 [[84]] wherein the package stiffener [[frame]] is positioned at separate corner edges of the substrate.

68. (Cancelled)

69. (Currently Amended) An integrated circuit (IC) package as claimed in claim 2 [[68]] wherein the package stiffener [[frame]] has rounded corners.

70. (Currently Amended) An integrated circuit (IC) package as claimed in claim 2 [[84]] wherein the package stiffener [[frame]] and the substrate have similar coefficients of thermal expansion.

71-72. (Cancelled)

73. (Currently Amended) An integrated circuit (IC) package as claimed in claim 2 [[72]] wherein the insulating couplers aid in [[the]] structural integrity of the package stiffener [[frame]].

74. (Currently Amended) An integrated circuit (IC) package as claimed in claim 2 [[84]] further comprising a spreader plate that couples the package stiffener [[frame]] and the die, wherein the package stiffener [[frame]] and the die are between the spreader plate and the substrate.

75. (Currently Amended) An integrated circuit (IC) package as claimed in claim 74 wherein the spreader plate and the package stiffener [[frame]] are integral.

76-78. (Cancelled)

79. (Currently Amended) An integrated circuit (IC) package as claimed in claim 2 [[78]] wherein the package stiffener includes a capacitor that includes an insulator.

80-92. (Cancelled)

Authorization for this examiner's amendment was given in a telephone interview with Lucianda Price on 9-15-06.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Reasons for Allowance

3. The following is an examiner's statement of reasons for allowance:

The references of record do not teach the limitations "a package stiffener mounted at a perimeter of the substrate directly and not upon an interposer, and arranged apart from the die on the substrate to deliver low-inductance current to the die, via the substrate directly and not via the interposer" and "wherein the package stiffener includes a copper ring split into power and ground portions, and insulating couplers electrically isolating the power and ground portions of the split copper ring" in an IC package arranged to supply power directly via stiffener.

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Nitin Parekh whose telephone number is 571-272-1663. The examiner can normally be reached on 09:00AM-05:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Eddie Lee can be reached on 571-272-1732. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAN or Public PAG. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAG system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0956.

NP

9-15-05



NITIN PAREKH

PRIMARY EXAMINER

TECHNOLOGY CENTER 2800